

Program

**Semiconductor Technology
for
Ultra Large Scale Integrated Circuits
and
Thin Film Transistors II**

5 July – 10 July 2009

Xi'an Garden Hotel, Xi'an, China

Conference Chair

Yue Kuo
Texas A&M University

Conference Co-Chairs

Michael Shur
Rensselaer Polytechnic Institute

Dieter Ast
Cornell University

William Milne
Cambridge University

Shaozhen Xiong
Nankai University



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Sunday, July 5, 2009

16:30 – 18:30	Registration (Hotel Lobby)
18:30 – 20:00	Opening Reception
20:00 – 21:30	Opening Dinner

Notes

- Technical Sessions and Social Hours will be in Magnolia Hall (2nd Floor).
- Poster Sessions will be in Pearl Hall (2nd Floor).
- All meals, with the exception of Western style breakfast, will be in the Crabapple Restaurant (1st Floor).
- Western style breakfast will be in the Apricot Restaurant (2nd Floor).
- Audiotaping, videotaping and photography of presentations are strictly prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.

Monday, July 6, 2009

07:30 – 08:30	Breakfast Buffet
08:30 – 08:40	Welcome and Conference Overview Y. Kuo, M. Shur, W. Milne, and S. Xiong ECI Technical Liaison N. Li Local Committee Chair C. Liu
08:40 – 10:55	<u>Plenary Talks</u> Session Chair: Y. Kuo, Texas A&M University
08:40 – 09:20	TECHNOLOGY DEVELOPMENT STRATEGY OF CHINESE IC FABRICATION T. Ye, Institute of Microelectronics, Chinese Academy of Sciences, Beijing
09:20 – 10:00	AN OVERVIEW OF NEDO'S ELECTRONICS TECHNOLOGY DEVELOPMENT PROJECTS A. Ando, New Energy and Industrial Technology Development Organization (NEDO), Kawasaki, Kanagawa
10:00 – 10:40	RELIABILITY AND OPTIMIZATION W. Kuo, City University of Hong Kong, Kowloon, Hong Kong
10:40 – 10:55	Coffee Break

Wednesday, July 8, 2009 (continued)

- 08:45 – 09:10 **SUBSTRATE ENGINEERING FOR 32 nm AND BEYOND**
B.-Y. Nguyen, C. Mazure, G. Celler, SOITEC, Parc Technologique des Fontaines, Bernin
- 09:10 – 09:35 **SELECTIVE EPITAXY OF Si AND SiGe FOR FUTURE MOS DEVICES**
I. Mizushima, Toshiba Corporation, Yokohama, Kanagawa
- 09:35 – 10:00 **DEFECT ASPECTS OF Ge-ON-Si MATERIALS AND DEVICES**
C. Claeys, G. Eneman, G. Wang, R. Loo, E. Simoen, IMEC, Leuven
- 10:00 – 10:20 **SURFACE ROUGHENING AND MICROSTRUCTURE OF TANTALUM NITRIDE FILMS SPUTTERED AT DIFFERENT N₂/Ar FLOW RATIOS**
J. Yang, B. Liu, Y. Wang, C. Liu, X. Yin, Sichuan University, Chengdu
- 10:20 – 10:40 Coffee Break
- 10:40 – 12:40 **Challenges in TFT Materials**
Session Chairs: M. Hatano, Hitachi
 T. P. Ma, Yale University
- 10:40 – 11:05 **TRANSPARENT AMORPHOUS OXIDE SEMICONDUCTORS (TAOS)**
Toshio Kamiya, H. Hosono, Tokyo Institute of Technology, Yokohama, Kanagawa
- 11:05 – 11:30 **THE POTENTIAL APPLICATION OF OXIDE THIN FILM TRANSISTOR FOR ACTIVE MATRIX DISPLAY**
J. Y. Kwon, K. S. Son, J. S. Jung, T. S. Kim, K. H. Lee, J. S. Park, Y. H. Choi, S. Y. Lee, Samsung Advanced Institute of Technology, Yongin, Gyeonggi-Do
- 11:30 – 11:50 **SOI/NANOSTRUCTURE PLATFORM FOR GAS SENSING**
W. I. Milne, M. S. Haque, S. Z. Ali, P. K. Guha, S. P. Oei, F. Udrea
Cambridge University, Cambridge;
J. Park, S. Maeng, ETRI;
K. B. K. Teo, Aixtron, Swavesey, Cambridge
- 12:00 – 13:00 Lunch
- 13:00 – 18:30 Free Time for leisure, recreation, discussion *ad hoc* sessions
Optional Excursion
- 18:30 – 20:00 Dinner
- 20:00 – 22:00 **Poster session/Social Hour**
Session Chair: C. Wu, Nankai University

Thursday, July 9, 2009

- 07:20 – 08:20 Breakfast Buffet
- 08:20 – 10:15 **Challenges in Advanced IC Processes**
Session Chairs: M. Shur, Rensselaer Polytechnic Institute
 R. Huang, Peking University
- 08:20 – 08:45 **ATOMICALLY CONTROLLED PROCESSING FOR GROUP IV SEMICONDUCTORS**
J. Murota, M. Sakuraba, Tohoku University, Sendai, Miyagi

Thursday, July 9, 2009 (continued)

- 08:45 – 09:10 **ATOMIC LAYER DOPING FOR FUTURE Si BASED DEVICES**
B. Tillack, IHP and Technische Universitaet Berlin, Frankfurt (Oder), Brandenburg
Y. Yamamoto, IHP, Frankfurt (Oder), Brandenburg
- 09:10 – 09:35 **BIPOLAR DEVICE AND CIRCUIT TECHNOLOGIES FOR FUTURE WIRELESS COMMUNICATIONS**
K. Washio, Hitachi Ltd., Kokubunji, Tokyo
- 09:35 – 09:55 **FIRST PRINCIPLE CALCULATION OF MULTI-FIELD MODULATED ELECTRONIC AND STRUCTURAL PROPERTIES OF Si NANOWIRES**
R.-Q. Zhang, Q. Jiang, Jilin University, Changchun
- 09:55 – 10:15 **DIRECT EXPERIMENTAL EVIDENCE ON THE ELECTROMIGRATION-INDUCED CREEP BEHAVIORS IN Cu THIN FILMS**
Z. Wang, G. Liu, B. Sun, H. Ling, J. Sun, Xi'an Jiaotong University, Xi'an
- 10:15 – 10:40 Coffee Break
- 10:40 – 13:00 **Challenges in Flexible Electronics**
Session Chairs: M. A. Reed, Yale University
F. Templier, CEA-LETI Minatec
- 10:40 – 11:05 **HIGH PERFORMANCE POLY-Si TFT ON FLEXIBLE SUBSTRATE**
J. Jang, J. H. Chen, W. K. Lee, Kyung Hee University, Seoul
- 11:05 – 11:30 **VERTICAL CHANNEL THIN FILM TRANSISTOR TECHNOLOGY: SIMILAR APPROACH WITH 3D-ULSI MONOLITHIC TECHNOLOGY**
O. Bonnaud, University of Rennes 1, Rennes
- 11:30 – 11:55 **A-Si:H TFT NONVOLATILE MEMORIES AND COPPER INTERCONNECT FOR RIGID AND FLEXIBLE ELECTRONICS**
Y. Kuo, Texas A&M University, College Station, TX
- 11:55 – 12:20 **MILLISECOND THERMAL PROCESSING FOR TFT AND ULSI**
S. Higashi, Hiroshima University, Higashi-Hiroshima, Hiroshima, Kanagawa
- 12:20 – 12:40 **SILICON BASED THIN FILM TRANSISTORS ON FLEXIBLE SUBSTRATES**
A. Sazonov, University of Waterloo, Waterloo
- 12:40 – 14:00 Lunch
- 14:00 – 16:00 Free Time for leisure, recreation, discussion *ad hoc* sessions
- 16:00 – 16:30 Afternoon Coffee
- 16:30 – 17:30 **Panel Discussion: Challenges in IC and TFT Fabrication**
Session Chairs: C. Claeys, IMEC
M. Hatano, Hitachi
Panelists: TBA
- 18:30 Conference Banquet

Friday, July 10, 2009

- 07:20 – 08:20 Breakfast Buffet
- 08:20 – 10:00 **Challenges in New Devices and Applications**
Session Chairs: S. Xiong, Nankai University
R. Ishihara, Delft University of Technology
- 08:20 – 08:45 **ORGANISATION OF SILICON NANOWIRES AND CARBON NANOTUBES IN LATERAL POROUS ALUMINA MEMBRANES**
D. Pribat, Ecole Polytechnique, Palaiseau
- 08:45 – 09:10 **NOVEL ASYMMETRIC TUNNELING DEVICES FOR LOW POWER ULSI**
J. Woo, N. Venkatagirish, R. Jhaveri, A. Tura, H.-Y. Chang
University of California, Los Angeles, CA
- 09:10 – 09:30 **A NEW METHOD OF PEDOT ELECTRODE FORMATION AND ITS APPLICATION TO PENTACENE OTFTS**
H. S. Soh, H. H. Kim, A. Kim, J. G. Lee, Kookmin University, Seongbuk-gu, Seoul;
C. J. Yu, Pohang Accelerator Laboratory
- 09:30 – 09:50 **SIMULATION OF SET PROCESS IN PHASE-CHANGE RANDOM ACCESS MEMORY BY THREE-DIMENSION FINITE ELEMENT MODELING**
Y. Gong, Z. Song, Y. Ling, B. Liu, Y. Liu, S. Ding, S. Feng
Chinese Academy of Sciences, Shanghai
- 09:50 – 10:20 Coffee Break
- 10:20 – 11:30 **Challenges in Nano Devices**
Session Chairs: C. Claeys, IMEC
A. Nathan, University College London
- 10:20 – 10:45 **LABEL-FREE SENSING WITH SILICON NANOWIRES**
M. A. Reed, Yale University, New Haven, CT
- 10:45 – 11:05 **A 16KB PHASE CHANGE MEMORY TEST CHIP WITH 0.18 μm PROCESS**
S. Ding, Z. Song, B. Liu, D. Cai, X. Chen, Y. Chen, M. Zhong, G. Feng, C. Xu, S. Feng, Chinese Academy of Sciences, Shanghai;
Z. Xie, Z. Yang, X. Wan, F. Zhang, G. Wu, Y. Xiang
Semiconductor Manufacturing International Corporation, Shanghai
- 11:05 – 11:30 **FABRICATION AND TRANSPORT BEHAVIOR INVESTIGATION OF GATE-ALL-AROUND SILICON NANOWIRE TRANSISTOR**
R. Huang, R. Wang, Y. Tian, J. Zhuge, L. Zhang, Y. Wang, C. Liu, Y. Ai, X. Zhang, Y. Wang, Peking University, Beijing
- 12:00 Lunch
- 14:00 Departure

POSTER SESSION

- 1. ATOMIC VAPOR DEPOSITION OF TiN WITH DILUTED TETRAKIS (DIETHYLAMIDO) TITANIUM (TDEAT) FOR PHASE CHANGE MEMORY**
L. Wang, B. Liu, Z. Song, S. Feng, Chinese Academy of Sciences, Shanghai;
Z. Zhou, Y. Xiang, F. Zhang, Semiconductor Manufacturing International Corporation, Shanghai
- 2. HYDROGEN PASSIVATION FOR THE ENHANCEMENT OF POLY-Si PERFORMANCE CRYSTALLIZED BY DOUBLE-FREQUENCY YAG LASER**
J. Li, Y. Ying, L. He, Z. Meng, C. Wu, S. Xiong, Nankai University, Tianjin;
H. S. Kwok, The Hong Kong University of Science and Technology
- 3. METAL INDUCED CRYSTALLIZED POLY-Si THIN FILMS AND THIN FILM TRANSISTORS**
C. Wu, Z. Meng, X. Li, Z. Liu, Nankai University, Tianjin;
S. Zhao, M. Wong, H. S. Kwok, The Hong Kong University of Science and Technology;
S. Xiong, Nankai University, Tianjin
- 4. DESIGN OF PMOS POLY-Si TFT SHIFT REGISTER**
P. Sun, D. Hao, Z. Meng, C. Wu, J. Li, S. Xiong, Nankai University, Tianjin
- 5. EFFECT OF Ge₂Sb₂Te₅ MATERIAL PROPERTIES ON ITS CMP PROCESS**
M. Zhong, Z. Song, B. Liu, S. Feng, China Academy of Sciences, Shanghai;
F. Zhang, Y. Xiang, Semiconductor Manufacturing International Corporation, Shanghai
- 6. DEVELOPMENT OF AMORPHOUS IZO AND IGZO BASED TRANSPARENT THIN FILM TRANSISTORS FOR OLED DISPLAY**
Y. Li, X. Hu, J. Zhang, X. Hou, Xi'an Jiaotong University, Xi'an
- 7. THE EFFECT OF DC-PULSED UNBALANCED MAGNETRON SPUTTERING ON THE PROPERTIES OF Cu FILMS AND THERMAL STABILITY OF Cu/ZrN BILAY FILMS**
Y. H. Li, Z. X. Song, J.A Wang, K. W. Xu, Xi'an Jiaotong University, Xi'an
- 8. IMPROVED BARRIER PROPERTY OF ZrN DIFFUSION BARRIER PREPARED BY ION BEAM ASSISTED DEPOSITION**
Z. X. Song, J. A Wang, Y. H. Li, K. W. Xu, Xi'an Jiaotong University, Xi'an
- 9. THE EFFECTS OF ALTERNATING CURRENT ON DEFORMATION AND FAILURE OF 60-nm-THICK NANOCRYSTALLINE Cu LINES**
J. Y. Zhang, J. Zhang, G. Liu, Y. Zhao, J. Sun, Xi'an Jiaotong University, Xi'an
- 10. BREAKDOWN OF SMALL DIAMETER Si NANOWIRES UNDER EXTERNAL ELECTRIC FIELD: FIRST-PRINCIPLE CALCULATION**
R.Q. Zhang, N. Gao, Z. Wen, Q. Jiang, Jilin University, Changchun
- 11. HIGH RELIABLE BOTTOM-GATE THIN-FILM TRANSISTORS ENHANCED BY LOW-TEMPERATURE EXCIMER LASER CRYSTALLIZATION**
J.L. Wang, Ming Chi University of Technology, Taishan, Taipei;
C.C. Tsai, National Chiao Tung University;
C.C. Hwang, T.Y. Hsieh, Ming Chi University of Technology;
H.C. Cheng, National Chiao-Tung University

12. **LOW-TEMPERATURE POLYCRYSTALLINE SILICON THIN-FILM TRANSISTORS FABRICATED VIA GREEN CONTINUOUS WAVE LASER CRYSTALLIZATION**
J.L. Wang, Ming Chi University of Technology, Taishan, Taipei;
C.C. Tsai, National Chiao Tung University;
C.C. Hwang, D.C. Shye, Ming Chi University of Technology;
H.C. Cheng, National Chiao-Tung University
13. **DRY ETCHING OF NANOSIZED $\text{Si}_2\text{Sb}_2\text{Te}_5$ PATTERNS USING TiN HARD MASK FOR HIGH DENSITY PHASE-CHANGE MEMORY**
G. Feng, Z. Song, B. Liu, S. Feng, Chinese Academy of Sciences, Shanghai;
B. Chen, Silicon Storage Technology Inc., Sunnyvale, CA
14. **STABILITY STUDY OF ZnO TFT USING A SIMPLE AND EFFECTIVE MODEL**
C. Dong, Shanghai Jiao Tong University, Shanghai;
J. Li, B. Jin, D. Bu, Sva (Group) Co., Ltd.;
Y. Su, Shanghai Jiao Tong University, Shanghai
15. **THE ELECTRICAL PROPERTY OF LTPS TFTS AS A FUNCTION OF VARIOUS CHANNEL WIDTH AND LENGTH**
H. Park, S. Jung, K. Jang, J. Yi, Sungkyunkwan University, Suwon, Kyungki
16. **THE OPTICAL AND ELECTRICAL PROPERTIES OF AZO FILMS AND THEIR AZO TFT CHARACTERISTICS**
K. Yoon, K. Jang, S. Jung, J. Yi, Sungkyunkwan University, Suwon, Gyeonggi-Do
17. **IMPROVEMENT OF INTERFACIAL ADHESION STRENGTH AND THERMAL STABILITY OF Cu/CAP BARRIER/LOW-K DIELECTRIC STACK BY PLASMA TREATMENT ON THE SURFACE OF Cu FILM**
B. Liu, J. J. Yang, Y. Wang, Sichuan University, Chengdu;
K. W. Xu, Xi'an Jiaotong University, Xi'an
18. **RESEARCH ON INTEGRATION OF ORGANIC THIN-FILM TRANSISTOR AND POLYMER**
J. Zou, L.-F. Lan, W. Yang, J.-B. Peng, South China University of Technology
19. **HIGH MOBILITY TE NANOWIRE FIELD-EFFECT TRANSISTORS**
H. Tao, D. Qin, Y. Cao, South China University of Technology